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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/596,431 | WILHELMSSON ET AL. | |
| | Examiner | Art Unit | |
| | DHAVAL PATEL | 2611 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *04 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *2-23,25-34,37 and 38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-23,25-34,37 and 38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection because of newly found references.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 19,25,26,34 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Martin et al. (7,295,638) (hereafter Martin).**

Regarding claim 19, Martin discloses a method and apparatus of receiving a spread-spectrum signal (Fig. 3, receiver), the method comprising correlating ( Fig. 5, correlate, 290) the received spread-spectrum signal ( Fig. 5, binary data source received) with a reference signal ( Fig. 4, spreading code generator, 216 and 292) to detect the presence of one of a number of reference spreading codes ( Fig. 5); wherein the correlating further comprises performing at least one of the following steps resulting in a differentiated correlation signal: differentiating the received spread-spectrum signal

(Fig. 5, differential detector, 270 with delayed received signal, 278 and complex conjugate, 282, col. 3 lines 50-53) and the reference signal ( Fig. 5, differential reference code, col. 16 lines 56-60); and differentiating the correlation signal ( Fig. 5, col. 16 lines 35-37, and lines 56-59): and wherein the differentiated correlation signal comprises a sequence of signal samples (Fig. 5, binary data source, 204 and up sampling, 208, each signal sample having a complex value (Fig. 3, I and Q values from down-conversion is complex value). and wherein the spreading code is indicative of a number of signal sources (col. 5 lines 3-7 discloses a correlator receives the differentially detected signal and correlates the differentially detected signal with one or more DSSS codes to produce decision statistics for determining the transmitted information).

Regarding claims 25, Martin further discloses a method and apparatus, wherein the method further comprises detecting a frequency error of the received spread-spectrum signal from the differentiated correlation signal (col. 12 lines 63-67 discloses differential detection of code helps mitigate the phase noise as well as frequency offsets).

Regarding claims 26, Martin further discloses a method and apparatus, further comprising accumulating the differentiated correlation signal to obtain a correlation value (Fig. 5, integrator, 294).

Regarding claim 34, Martin further discloses a method wherein differentiating a signal comprises multiplying a signal sample of the signal with the complex conjugate of a preceding sample ( Fig. 5, multiplier 274 multiply the signal sample with the complex conjugate (282)).

Regarding claim 38, Martin discloses a method and apparatus of receiving a spread-spectrum signal (Fig. 3, receiver), the method comprising correlating ( Fig. 5, correlate, 290) the received spread-spectrum signal ( Fig. 5, binary data source received) with a reference signal ( Fig. 4, spreading code generator, 216 and 292) to detect the presence of one of a number of reference spreading codes ( Fig. 5); wherein the correlating further comprises performing at least one of the following steps resulting in a differentiated correlation signal: differentiating the received spread-spectrum signal (Fig. 5, differential detector, 270 with delayed received signal, 278 and complex conjugate, 282, col. 3 lines 50-53) and the reference signal ( Fig. 5, differential reference code, col. 16 lines 56-60); and differentiating the correlation signal ( Fig. 5, col. 16 lines 35-37, and lines 56-59): and wherein the differentiated correlation signal comprises a sequence of signal samples (Fig. 5, binary data source, 204 and up sampling, 208, each signal sample having a complex value (Fig. 3, I and Q values from down-conversion is complex value), wherein the device is a communication device (col. 3 lines 20-25, receiver).

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. **Claims 2,3,6,9, 12, 15, 20,21, 22, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin in view of Abraham et al. (US 2004/0141549).**

Regarding claims 2, Martin further discloses a method and apparatus, wherein the method further comprises detecting a frequency error of the received spread-spectrum signal from the differentiated correlation signal (col. 12 lines 63-67 discloses differential detection of code helps mitigate the phase noise as well as frequency offsets).

Regarding claims 3, Martin further discloses a method and apparatus, further comprising accumulating the differentiated correlation signal to obtain a correlation value (Fig. 5, integrator, 294).

Regarding claim 6, Abraham further teaches a method wherein accumulating comprises coherently accumulating the differentiated correlation signal (Fig. 13, 1304, coherent integration timing).

Regarding claim 9, Abraham further teaches a method wherein differentiating a signal comprises delaying the signal by a predetermined number of chips (Fig. 4 ,8 and 11, [0014]

Regarding claim 12, Martin further discloses a method further comprising de-spreading the received spread spectrum signal; and extracting the information data from the de-spread signal (col. 4 lines 40-45, de-spreading)

Regarding claim 15, Martin further discloses a method wherein differentiating a signal comprises multiplying a signal sample of the signal with the complex conjugate of a preceding sample ( Fig. 5, multiplier 274 multiply the signal sample with the complex conjugate (282)).

Regarding claim 20, Abraham further teaches a method wherein the signal source is one of a number of space vehicles of a positioning system (page 3, [0039] and [0040], GPS signals send by satellites).

Regarding claim 21, Abraham further teaches a method wherein the positioning system is the Global positioning system (page 3, [0039] and [0040]).

Regarding claims 22, Martin discloses a method and apparatus of receiving a spread-spectrum signal (Fig. 3, receiver), the method comprising correlating ( Fig. 5, correlate, 290) the received spread-spectrum signal ( Fig. 5, binary data source received) with a reference signal ( Fig. 4, spreading code generator, 216 and 292) to detect the presence of one of a number of reference spreading codes ( Fig. 5); wherein the correlating further comprises performing at least one of the following steps resulting in a differentiated correlation signal: differentiating the received spread-spectrum signal (Fig. 5, differential detector, 270 with delayed received signal, 278 and complex conjugate, 282, col. 3 lines 50-53) and the reference signal ( Fig. 5, differential reference code, col. 16 lines 56-60); and differentiating the correlation signal ( Fig. 5, col. 16 lines 35-37, and lines 56-59): and wherein the differentiated correlation signal comprises a sequence of signal samples (Fig. 5, binary data source, 204 and up sampling, 208, each signal sample having a complex value (Fig. 3, I and Q values from down-conversion is complex value).

But, Martin does not explicitly disclose spreading code is pseudo-random code.

However, in the same field of endeavor, Abraham teaches pseudo random noise code [0005] and [0012].

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to detect the transmitted signal by correlation the signal with

spread spectrum code such as pseudo random noise code to detect the transmitted signal, the motivation is well-known as pseudo random noise code is used for synchronization purpose to accurately detecting the transmitted signal [0005].

Regarding claims 37, Martin discloses a method and apparatus of receiving a spread-spectrum signal (Fig. 3, receiver), the method comprising correlating ( Fig. 5, correlate, 290) the received spread-spectrum signal ( Fig. 5, binary data source received) with a reference signal ( Fig. 4, spreading code generator, 216 and 292) to detect the presence of one of a number of reference spreading codes ( Fig. 5); wherein the correlating further comprises performing at least one of the following steps resulting in a differentiated correlation signal: differentiating the received spread-spectrum signal (Fig. 5, differential detector, 270 with delayed received signal, 278 and complex conjugate, 282, col. 3 lines 50-53) and the reference signal ( Fig. 5, differential reference code, col. 16 lines 56-60); and differentiating the correlation signal ( Fig. 5, col. 16 lines 35-37, and lines 56-59): and wherein the differentiated correlation signal comprises a sequence of signal samples (Fig. 5, binary data source, 204 and up sampling, 208, each signal sample having a complex value (Fig. 3, I and Q values from down-conversion is complex value).

But, Martin does not explicitly disclose wherein the device is an autonomous Global positioning device (GPS).

However, in the same field of endeavor, Abraham teaches in [0005] and [0006] the GPS (global positioning system).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to perform the detection method as disclose by Martin, into the GPS system to detect the transmitted signal by correlation the differentially detected signal with direct spectrum spread codes, the motivation is well-known in the art.

6. **Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin and Abraham, and further in view of Imamura et al.**

Regarding claims 4, Martin and Abraham do not explicitly disclose a method, wherein the method further comprises detecting a frequency error of the from the determined correlation value.

In the same field of endeavor, Imamura teaches signal receiver and method of compensating frequency offset in which as shown in Fig. 11, teaches correlator units to correlator the received signal with the reference signal (51, 52, 53 and 61) and detecting the peak value (54). Furthermore, Fig. 11 teaches from the peak detector the frequency offset estimation value (frequency error).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Imamura, into the system of Martin and Abraham, as a whole, so as to detect the frequency error from the accumulated or integrated differential values, the motivation is to provide a signal receiver and a frequency offset compensation (col. 5 lines 32-34).

Regarding claims 5, Martin and Abraham do not explicitly disclose a method according to claim 4, further comprising determining a frequency compensation factor from the angle argument of the correlation value.

In the same field of endeavor, Imamura teaches signal receiver and method of compensating frequency offset in which as shown in Fig. 11, teaches correlator units to correlator the received signal with the reference signal (51, 52, 53 and 61) and detecting the peak value (54). Furthermore, Fig. 11 teaches from the peak detector the frequency offset estimation value (frequency error). Furthermore, Imamura teaches generating frequency offset compensated signal by applying the phase rotation to the received signal (65, frequency offset estimating circuit and 37, phase rotation circuit to generate frequency offset compensated signal, here, phase rotation would be compensation factor).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Imamura, into the system of Martin and Imamura, as a whole, so as to detect the frequency error from the accumulated or integrated differential values and generate frequency offset compensation signal by applying phase rotation, the motivation is to provide a signal receiver and a frequency offset compensation (col. 5 lines 32-34).

7. **Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin and Abraham, as applied to claim 6 above, and further in view of Lennen et al. ( US 6,888,879) (hereafter Lennen).**

Regarding claims 7, the combined teachings Martin and Abraham do not explicitly disclose a method according to claim 6, wherein the received spread-spectrum signal comprises a digital information message encoded as bits, wherein bit transitions of the digital information message occur at predetermined transition time intervals; and wherein coherently accumulating comprises coherently accumulating the differentiated correlation signal over a time interval that is longer than half the transition time interval.

In the same field of endeavor, Lennen teaches method and apparatus for fast acquisition and low SNR tracking in satellite positioning system in which col. 10 lines 22-50 teaches memory processor 83 accumulates samples that are identically positioned within the code epoch period in the incoming C/A code. GPS data are 20 ms long and hence the summation may be done over a 20 msec period (or longer accumulation or integration if data bit transitions are known). The 20 msec summations of the incoming signals are played back at the faster rate. If the memory accumulates for longer, 100msec instead of 20msec for example, further improvement is achieved. and accumulations for period longer than 20msec in the processor may require knowledge of data bit transitions.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Lennen, into the system of Martin, Imamura and Abraham, as a whole, so as to coherently accumulating the differential correlation results of Martin, Imamura and Abraham, with longer accumulation results, the motivation is to provide improved signal acquisition and measurement in satellite positioning receivers and in particular to fast acquisition in low SNR (col. 2 lines 54-57).

Regarding claim 8, Martin further discloses a method according to claim 7, wherein differentiating comprises differentiating on a single-chip time scale (col. 3 lines 57-63, differential chip detector with delayed by N chip period and N is preferably one).

8. **Claims 10, 11, 16, 17, 30, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin in view of Diggelen et al. (US 2004/0234008) (hereafter Diggelen).**

Regarding claims 10, 11 and 16, Martin discloses a method and apparatus of receiving a spread-spectrum signal (Fig. 3, receiver), the method comprising correlating ( Fig. 5, correlate, 290) the received spread-spectrum signal ( Fig. 5, binary data source received) with a reference signal ( Fig. 4, spreading code generator, 216 and 292) to detect the presence of one of a number of reference spreading codes ( Fig. 5); wherein the correlating further comprises performing at least one of the following steps resulting in a differentiated correlation signal: differentiating the received spread-spectrum signal (Fig. 5, differential detector, 270 with delayed received signal, 278 and complex conjugate, 282, col. 3 lines 50-53) and the reference signal ( Fig. 5, differential reference code, col. 16 lines 56-60); and differentiating the correlation signal ( Fig. 5, col. 16 lines 35-37, and lines 56-59): and wherein the differentiated correlation signal comprises a sequence of signal samples (Fig. 5, binary data source, 204 and up sampling, 208, each signal sample having a complex value (Fig. 3, I and Q values from down-conversion is complex value).

But, Martin does not explicitly providing a plurality of reference signals modulated by said one of a number of reference spreading codes and delayed by respective relative code delays; correlating the received spread-spectrum signal with the plurality of reference signals to obtain a corresponding plurality of differentiated correlation signals; accumulating each of the plurality of differentiated correlation signals to obtain a corresponding plurality of correlation values for respective code delays; and detecting a correlation peak in the plurality of correlation values to identify a code delay of the received spread-spectrum signal.

however, in the same field of endeavor, Diggelen teaches method and apparatus for reducing the time required to acquire a GPS signal in which [0028] teaches correlations (2181-218n) to produce a correlation between the input signal and a reference code (PRN code). The reference code supplied to each of the correlations is shifted by one half "chip" of the GPS PRN code, so, here, the code is differentiated since each code is delayed by certain chip time and correlation the received signal with the delayed PRN chip. Also the summer 220 sums all the outputs together such that if a high correlation results. [0029] also teaches to accurate correlate the signal, the correlation is performed in 1/2 chip intervals i.e. requiring delays, [0031] also teaches correlation performed on 1 thru 1023 chips and timing of the PRN code can be determined with correlation peak results. Also as this processing is performed for multiple channels, all the channels perform same correlation functions

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of the Diggelen, into the system of

Martin, as a whole, so as to perform differential correlation by multiplying the differential codes delayed by chip time with the differential received signal to accurately detecting the transmitted signal, the motivation is to reduce the time required to acquire a global positioning system (GPS) signal [0002].

Regarding claim 17, claim 17 is rejected for the same rationale claim 13 is rejected.

Claims 30 and 31 are rejected for the same rationale claims 10 and 11 are rejected since claims 30 and 31 recites the same subject matter as claims 10 and 11.

Claim 32 is rejected for the same rationale claim 17 is rejected as reciting the same subject matter

9. **Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martin and Abraham and further in view of Diggelen et al. (US 2004/0234008) ( hereafter Diggelen).**

Regarding claims 13 and 17 Martin further discloses differenating the received signal and multiplying the received differentiated received signal with the reference code to determine the correlation signal, however, Martin and Abraham do not explicitly disclose generating the differentiated reference signal and multiply differentiated reference signal with the differential detected signal.

however, in the same field of endeavor, Diggelen teaches method and apparatus for reducing the time required to acquire a GPS signal in which [0028] teaches correlations (2181-218n) to produce a correlation between the input signal and a reference code (PRN code). The reference code supplied to each of the correlations is shifted by one half “chip” of the GPS PRN code, so, here, the code is differentiated since each code is delayed by certain chip time and correlation the received signal with the delayed PRN chip. Also the summer 220 sums all the outputs together such that if a high correlation results. [0029] also teaches to accurate correlate the signal, the correlation is performed in 1/2 chip intervals i.e. requiring delays, [0031] also teaches correlation performed on 1 thru 1023 chips and timing of the PRN code can be determined with correlation peak results. Also as this processing is performed for multiple channels, all the channels perform same correlation functions

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of the Diggelen, into the system of Martin and Abraham, as a whole, so as to perform differential correlation by multiplying the differential codes delayed by chip time with the differential received signal to accurately detecting the transmitted signal, the motivation is to reduce the time required to acquire a global positioning system (GPS) signal[0002]

10. **Claims 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin and Abraham and further in view of Sato et al. ( US 2001/050950) ( hereafter Sato).**

Regarding claims 14, Martin and Abraham do not explicitly disclose determining a correlation signal from received spread spectrum signal and the reference signal and differentiating the correlation signal to obtain a differentiated correlation signal, in the same field of endeavor, Sato teaches as shown in Fig. 1 and 2, cross correlation calculating means for correlation received signal with the received pilot signal and differential detecting means for differentially detecting the correlation signal, therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Sato, into the system of Martin and Abraham as a whole, to generate the differentiated correlation signal by correlation the received and spreading signal and detecting the correlation signal, the motivation is to provide accurate path timing detection method ([0018] and [0019]).

11. **Claims 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martin and Diggerin and further in view of Sato et al.**

Regarding claims 18, Martin and Diggerein do not explicitly disclose determining a correlation signal from received spread spectrum signal and the reference signal and differentiating the correlation signal to obtain a differentiated correlation signal, in the same field of endeavor, Sato teaches as shown in Fig. 1 and 2, cross correlation calculating means for correlation received signal with the received pilot signal and differential detecting means for differentially detecting the correlation signal, therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Sato, into the system of Martin and Diggeren as a whole, to

generate the differentiated correlation signal by correlation the received and spreading signal and detecting the correlation signal, the motivation is to provide accurate path timing detection method ([0018] and [0019]).

12. **Claims 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martin in view of Applicant's admitted prior art (hereafter AAPA).**

Regarding claim 23, Martin discloses a method and apparatus of receiving a spread-spectrum signal (Fig. 3, receiver), the method comprising correlating ( Fig. 5, correlate, 290) the received spread-spectrum signal ( Fig. 5, binary data source received) with a reference signal ( Fig. 4, spreading code generator, 216 and 292) to detect the presence of one of a number of reference spreading codes ( Fig. 5); wherein the correlating further comprises performing at least one of the following steps resulting in a differentiated correlation signal: differentiating the received spread-spectrum signal (Fig. 5, differential detector, 270 with delayed received signal, 278 and complex conjugate, 282, col. 3 lines 50-53) and the reference signal ( Fig. 5, differential reference code, col. 16 lines 56-60); and differentiating the correlation signal ( Fig. 5, col. 16 lines 35-37, and lines 56-59): and wherein the differentiated correlation signal comprises a sequence of signal samples (Fig. 5, binary data source, 204 and up sampling, 208, each signal sample having a complex value (Fig. 3, I and Q values from down-conversion is complex value).

But, Martin does not explicitly disclose spreading code is Gold code.

However, AAPA teaches on page 2 lines 15-20 the signal detection using gold code sequence.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to detect the transmitted signal by correlation the signal with spread spectrum code such as Gold code to detect the transmitted signal, the motivation is well-known as Gold code is used for synchronization purpose to accurately detecting the transmitted signal [0005].

13. **Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin in view of Imamura et al.**

Regarding claim 27, Martin does not explicitly disclose a method, wherein the method further comprises detecting a frequency error of the from the determined correlation value.

In the same field of endeavor, Imamura teaches signal receiver and method of compensating frequency offset in which as shown in Fig. 11, teaches correlator units to correlator the received signal with the reference signal (51, 52, 53 and 61) and detecting the peak value (54). Furthermore, Fig. 11 teaches from the peak detector the frequency offset estimation value (frequency error).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Imamura, into the system of Martin, as a whole, so as to detect the frequency error from the accumulated or integrated

differential values, the motivation is to provide a signal receiver and a frequency offset compensation (col. 5 lines 32-34).

Regarding claims 5, Martin does not explicitly disclose a method according to claim 4, further comprising determining a frequency compensation factor from the angle argument of the correlation value.

In the same field of endeavor, Imamura teaches signal receiver and method of compensating frequency offset in which as shown in Fig. 11, teaches correlator units to correlator the received signal with the reference signal (51, 52, 53 and 61) and detecting the peak value (54). Furthermore, Fig. 11 teaches from the peak detector the frequency offset estimation value (frequency error). Furthermore, Imamura teaches generating frequency offset compensated signal by applying the phase rotation to the received signal (65, frequency offset estimating circuit and 37, phase rotation circuit to generate frequency offset compensated signal, here, phase rotation would be compensation factor).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Imamura, into the system of Martin, as a whole, so as to detect the frequency error from the accumulated or integrated differential values and generate frequency offset compensation signal by applying phase rotation, the motivation is to provide a signal receiver and a frequency offset compensation (col. 5 lines 32-34).

14. **Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martin in view of Lennen et al. (US 6,888,879) (hereafter Lennen).**

Regarding claim 29, Martin does not explicitly disclose a method according to claim 6, wherein the received spread-spectrum signal comprises a digital information message encoded as bits, wherein bit transitions of the digital information message occur at predetermined transition time intervals; and wherein coherently accumulating comprises coherently accumulating the differentiated correlation signal over a time interval that is longer than half the transition time interval.

In the same field of endeavor, Lennen teaches method and apparatus for fast acquisition and low SNR tracking in satellite positioning system in which col. 10 lines 22-50 teaches memory processor 83 accumulates samples that are identically positioned within the code epoch period in the incoming C/A code. GPS data are 20 ms long and hence the summation may be done over a 20 msec period (or longer accumulation or integration if data bit transitions are known). The 20 msec summations of the incoming signals are played back at the faster rate. If the memory accumulates for longer, 100msec instead of 20msec for example, further improvement is achieved. and accumulations for period longer than 20msec in the processor may require knowledge of data bit transitions.

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Lennen, into the system of Martin, as a whole, so as to coherently accumulating the differential correlation results of Martin, Imamura and Abraham, with longer accumulation results, the motivation is to provide

improved signal acquisition and measurement in satellite positioning receivers and in particular to fast acquisition in low SNR (col. 2 lines 54-57).

15. **Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Martin and in view of Sato et al.**

Regarding claims 18, Martin do not explicitly disclose determining a correlation signal from received spread spectrum signal and the reference signal and differentiating the correlation signal to obtain a differentiated correlation signal, in the same field of endeavor, Sato teaches as shown in Fig. 1 and 2, cross correlation calculating means for correlation received signal with the received pilot signal and differential detecting means for differentially detecting the correlation signal, therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Sato, into the system of Martin, as a whole, to generate the differentiated correlation signal by correlation the received and spreading signal and detecting the correlation signal, the motivation is to provide accurate path timing detection method ([0018] and [0019]).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DHAVAL PATEL whose telephone number is (571)270-1818. The examiner can normally be reached on M-F 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dhaval Patel/
Examiner, Art Unit 2611
12/16/2009
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611